CHALLENGES OF PACKAGING PHOTONIC DEVICES

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ABSTRACT

Photonic technology promises to greatly enhance spacecraft systems, such as phased array radar, by increasing bandwidth, reducing weight, increasing accuracy, reducing system cost, and performing functions which cannot be implemented with electronic devices. In spite of its potential benefits photonic technology has been slow to be incorporated into spacecraft and other airborne systems. The major reason for this is today's high cost of photonic devices and assemblies.

Chip level photonic devices are not much more expensive to manufacture than chip level electronic devices. It is the cost of packaging photonic devices and assemblies that make them much more expensive. The high cost of fabricating photonic assemblies results from the need to position parts within an assembly to submicron precision and then to fix them so they will not move more than submicrons over time when exposed to harsh environments.

This paper describes the challenges facing the photonic industry to improve the reliability of packaging while at the same time greatly reducing its cost. The developments required to do this are very detailed engineering, proper selection of materials, highly flexible positioning methods, and rugged fastening technology.